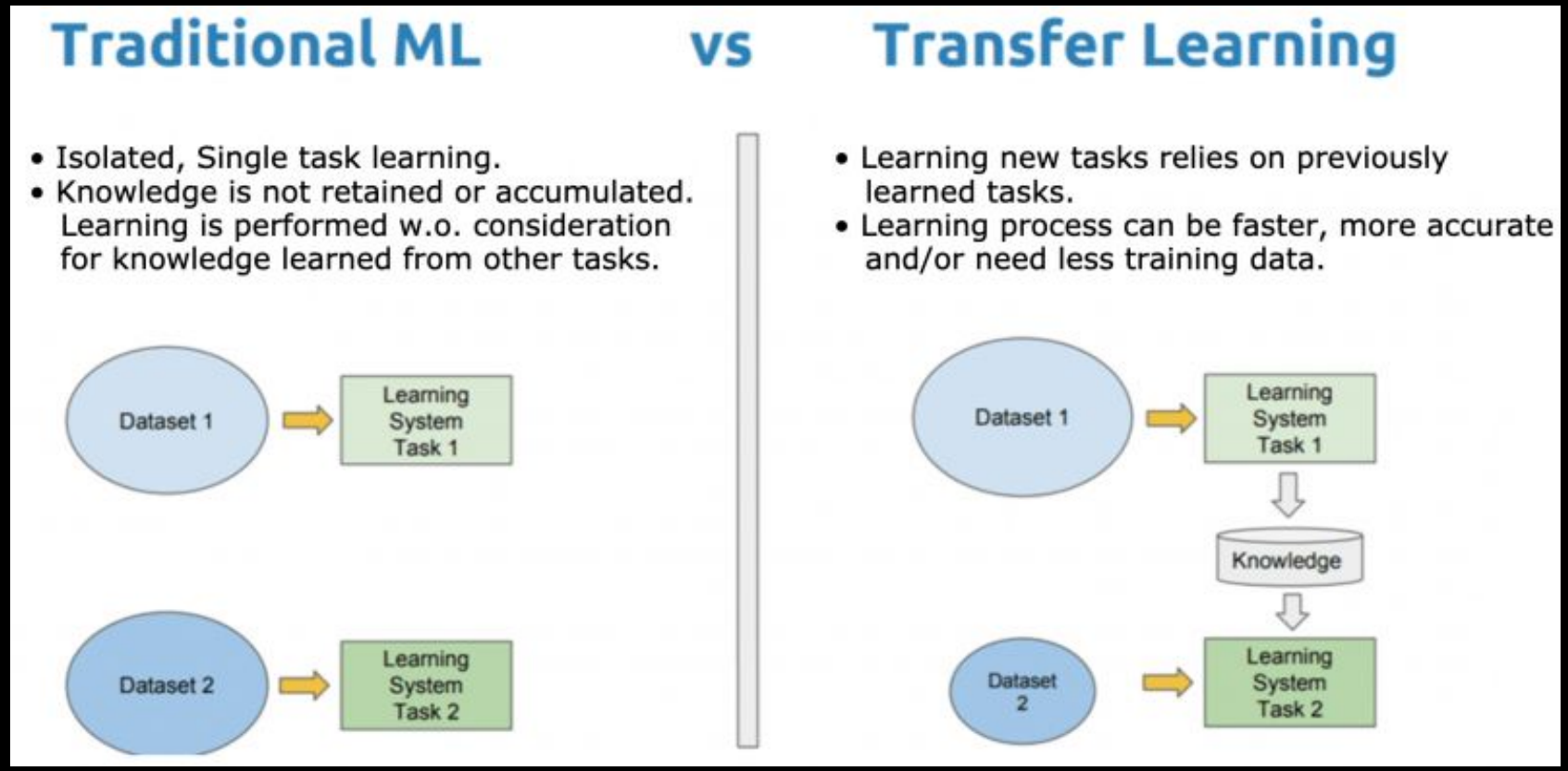
딥러닝 기초

-11-

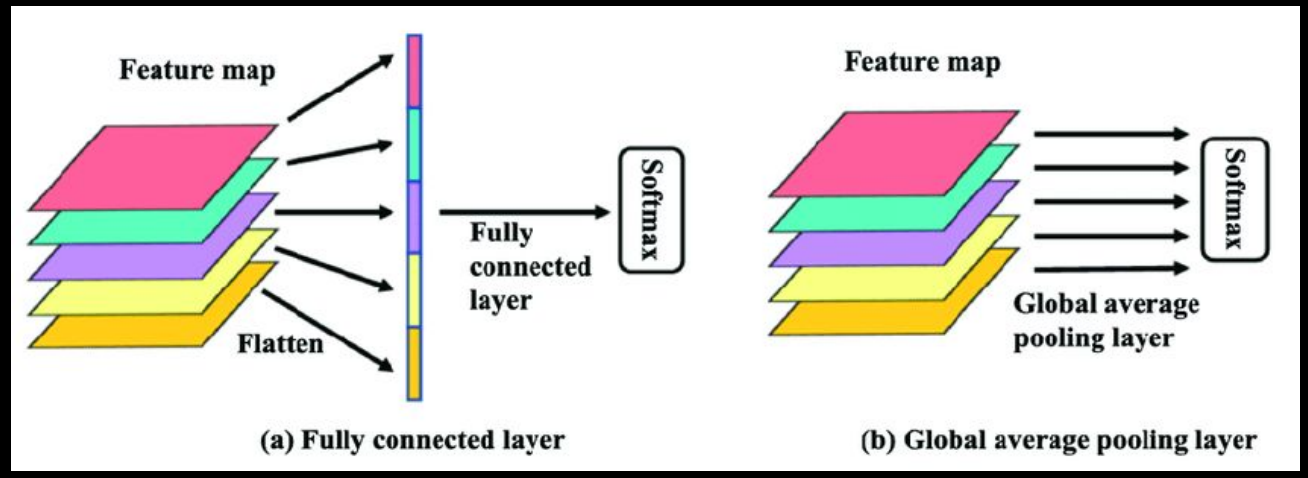
Autoencoder

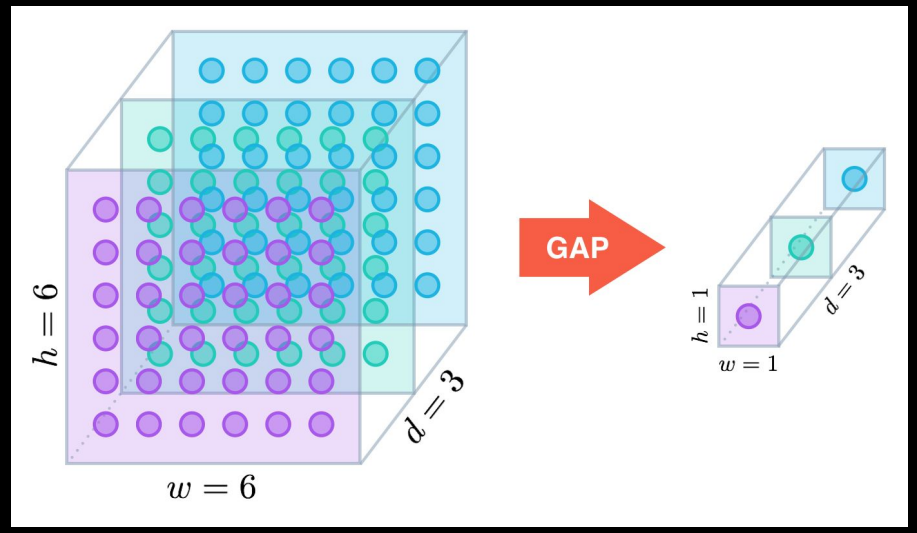
Transfer Learning

Transfer Learning (전이 학습)



Global Average Pooling





```python
model = Sequential([
                    Input((32, 32, 3)),
                    Resizing(96, 96),
                    RandomFlip("horizontal"),
                    RandomRotation(0.1),
                    MobileNetV2(include_top=False, weights="imagenet", input_shape=(96, 96, 3)),
                    GlobalAveragePooling2D(),
                    Dense(num_classes, activation="softmax")  # 출력층
])
```

```python
model.summary()
```

```
Model: "sequential_6"
_________________________________________________________________
 Layer (type)                Output Shape              Param #
=================================================================
 resizing_3 (Resizing)       (None, 96, 96, 3)         0

 random_flip (RandomFlip)    (None, 96, 96, 3)         0

 random_rotation (RandomRota  (None, 96, 96, 3)        0
 tion)

 mobilenetv2_1.00_96 (Functi  (None, 3, 3, 1280)       2257984
 onal)

 global_average_pooling2d_6   (None, 1280)             0
 (GlobalAveragePooling2D)

 dense_6 (Dense)             (None, 10)                12810

=================================================================
Total params: 2,270,794
Trainable params: 2,236,682
Non-trainable params: 34,112
_________________________________________________________________
```

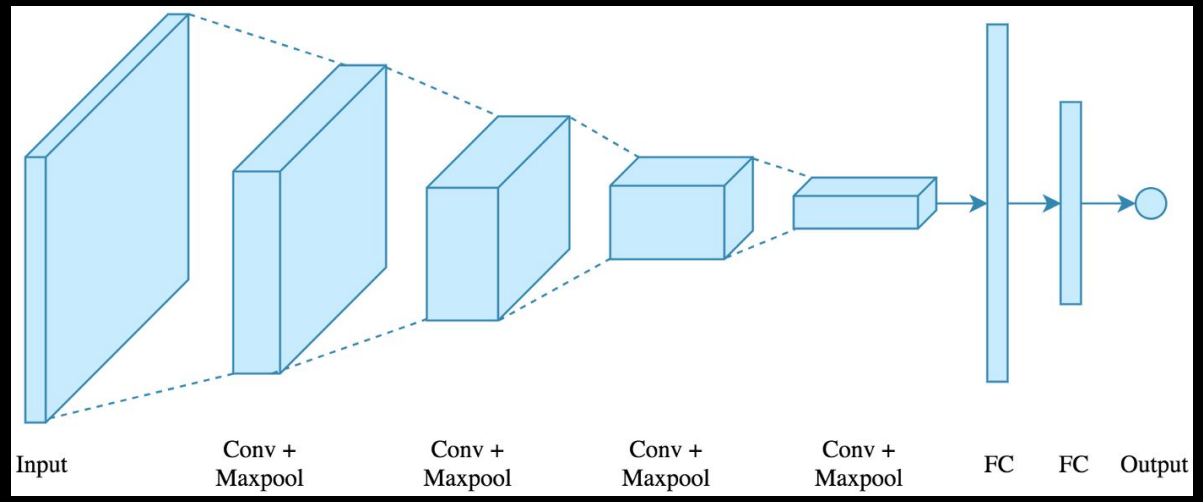
```python
model.compile(loss='categorical_crossentropy', optimizer='adam', metrics=['accuracy'])
```

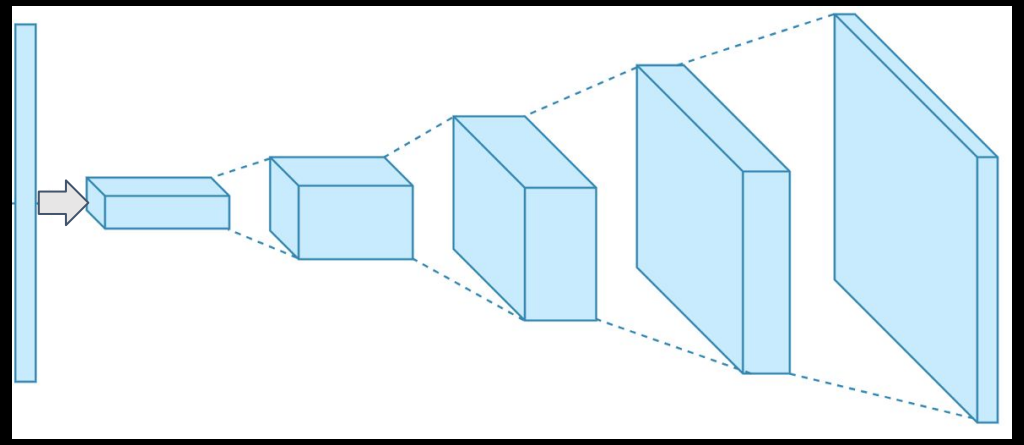
```python
history = model.fit(x_train, y_train, batch_size=32, epochs=10, validation_data=(x_test, y_test))
```

```
Epoch 1/10
1563/1563 [==============================] - 190s 118ms/step - loss: 0.7358 - accuracy: 0.7538 - val_loss: 4.0808 - val_accuracy: 0.4338
Epoch 2/10
1563/1563 [==============================] - 182s 116ms/step - loss: 0.5441 - accuracy: 0.8142 - val_loss: 2.5311 - val_accuracy: 0.5659
Epoch 3/10
1563/1563 [==============================] - 183s 117ms/step - loss: 0.4776 - accuracy: 0.8375 - val_loss: 1.9519 - val_accuracy: 0.6518
Epoch 4/10
1563/1563 [==============================] - 184s 118ms/step - loss: 0.4376 - accuracy: 0.8508 - val_loss: 2.6699 - val_accuracy: 0.5431
Epoch 5/10
1563/1563 [==============================] - 183s 117ms/step - loss: 0.3939 - accuracy: 0.8652 - val_loss: 1.1145 - val_accuracy: 0.7437
Epoch 6/10
1563/1563 [==============================] - 182s 117ms/step - loss: 0.3645 - accuracy: 0.8756 - val_loss: 2.0306 - val_accuracy: 0.6466
Epoch 7/10
1563/1563 [==============================] - 185s 118ms/step - loss: 0.3385 - accuracy: 0.8839 - val_loss: 1.1777 - val_accuracy: 0.7277
Epoch 8/10
1563/1563 [==============================] - 183s 117ms/step - loss: 0.3193 - accuracy: 0.8901 - val_loss: 0.7509 - val_accuracy: 0.8019
Epoch 9/10
1563/1563 [==============================] - 182s 116ms/step - loss: 0.2967 - accuracy: 0.8993 - val_loss: 0.4937 - val_accuracy: 0.8602
Epoch 10/10
1563/1563 [==============================] - 182s 117ms/step - loss: 0.2820 - accuracy: 0.9017 - val_loss: 0.4645 - val_accuracy: 0.8626
```

생성 모델

생성 모델?


Input
Conv + Maxpool
Conv + Maxpool
Conv + Maxpool
Conv + Maxpool
FC
FC
Output



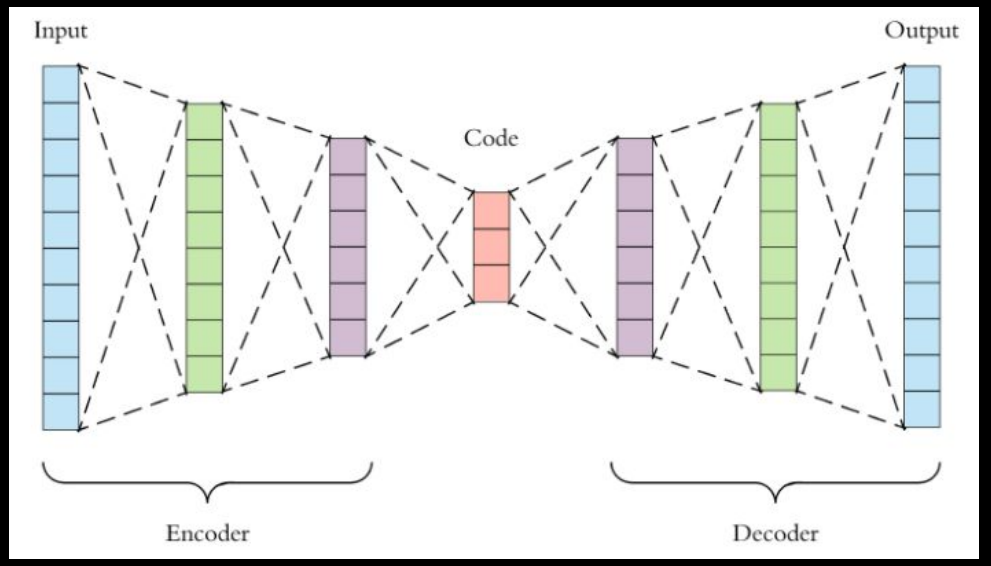
Autoencoder

Autoencoder

입력을 출력에 복사하도록 훈련된 특수한 유형의 신경망

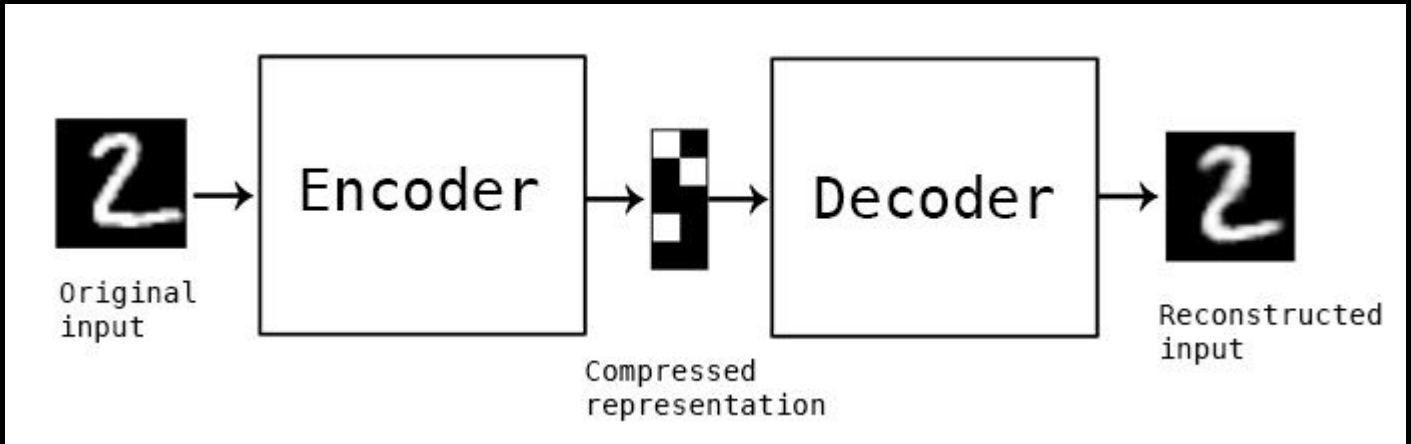
입력 데이터의 의미 있는 속성들을 추출 → 최소한의 차원만 가지고 특징을 표현

흑백
노이즈



컬러
디노이즈

실습 : 손글씨 Autoencoder



Q&A